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The Social Amplification of Risk and the Hazard Sequence:

The October 1995 Oral Contraceptive Pill Scare

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Abstract:

Hazard notifications routinely occur as part of the identification or management of a hazard. It is argued that a series of such notifications - a hazard sequence - may affect public responses to future notifications about that hazard and also that hazard sequences can help explain patterns of risk amplification, particularly how a risk becomes normalised. Exploration of the hazard sequence also means exploring hazard templates: frameworks through which people make sense of risk information across the lifetime of the hazard. Events surrounding the 1995 oral contraceptive 'pill scare' are used to illustrate the way in which a hazard sequence might operate.

Key words: risk, risk communication, social amplification of risk, oral contraceptive pill, hazard sequence, hazard template

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Introduction

The occurrence of hazard notifications are an integral part of the identification or management of a hazard. These notifications may be made by regulatory agencies or may be in the form of media coverage or statements by interested parties. The way in which current notifications about a hazard may constrain and shape public responses to future notifications about that hazard can be considered in relation to the concept of hazard sequences. We propose that a series of hazard notifications is referred to as a 'hazard sequence'. Events surrounding the 1995 oral contraceptive 'pill scare' are used to illustrate the way in which a hazard sequence might operate. We would argue that hazard sequences can help explain patterns of risk amplification and particularly, how a risk becomes normalised.

Observation of many hazard events bears witness to the way in which they rise and fall, ebb and flow, in public awareness and societal debate, suggesting intensified concerns at one point in time and apparent disinterest at another. Much of the burgeoning risk literature in recent years has focused upon documenting and explaining the interaction of lay, expert and regulatory attention that hazard events attract. Changing patterns of intensified and attenuated public concerns have been observed, differentially evident in different groups, often seeming unrelated to expert and regulatory words and actions³. Simply characterising these as irrational has increasingly been recognised as inaccurate and unhelpful (Bennett, 1999). Attention is increasingly drawn to the complexity and regularity of lay views, the different bodies of knowledge that such views are informed

³ It can be made clear at this point that use of the word 'public' is not meant to imply a homogeneity of view. The arguments being made assume a differentiated spectrum of beliefs on most issues.

by, and the characteristics of risk events that cause the most concern (Petts, Horlick-Jones, & Murdock, 2001; Grove-White, Macnaghten, & Wynne, 2000; Slovic, 1999). However, there has been little attention to how and why these views change across the lifetime of a hazard.

The question of how risk communications are likely to be interpreted across the life time of a hazard is a vital one for those concerned with the communication of public health risks. There is general agreement about many of the principles that inform the design of risk communication. There is clear and comprehensive guidance about, for example, the importance of understanding qualitative dimensions of risk judgements or the dangers of drawing comparisons between risks (Department of Health, 1998; Bennett & Calman, 1999). However, the question arises as to how specific risk communications are likely to be interpreted in the light of previous events. Attention has been drawn to the importance of this by Pidgeon, Henwood and Maguire (1999) who say that,

“the design of any risk communication needs to take as much account of what came before it, as it does of the message, content or objectives to be achieved in the present” (p.76).

Certainly, the notion that public responses to one hazard can be explained in terms of reactions to a previous and different hazard has been alluded to in the literature. For example, Reilly (1999) notes that responses to BSE in the UK in part stem from beliefs about safety issues around salmonella and listeria in the preceding years. It has also been argued that the different reactions to genetically modified foods found in the UK and the US are in turn rooted in their differential exposure to the BSE issue (Grove-White, Macnaghten, Mayer *et al.*, 1997). However, there is little clue in the literature as to the

processes that explain how a hazard notification at one time might affect responses to later hazard notifications. Perhaps the most obvious place in the risk literature to look for such a consideration is the Social Amplification of Risk Framework (Kasperson, Renn, Slovic *et al.*, 1998; Kasperson, 1992; Renn, Burns, Kasperson *et al.*, 1992; Pidgeon, 1999) which was constructed to help understand the rise and fall of risk issues over time. The central thrust of the framework is that socio-economic impacts of a risk event are determined by social processes rather than the physical characteristics of the event (such as numbers of people and places affected). It identifies categories of mediator/moderator which intervene between the risk event and its consequences and suggests a causal and temporal sequence in which they act. Representations of the risk are created as a hazard event becomes known, either through direct experience, or more commonly, through communication from 'stations of amplification' (e.g. media and educational institutions). Across the lifetime of the hazard this representation is revised. Information is refined, reconfigured and filtered at various levels: intra- and interpersonal, intra- and inter-group. These revised representations may stimulate behaviour changes both for the individual and society. Individuals may adopt different practices, groups may protest, organisations may change their policies or structures and government may regulate the risks differently.

The Social Amplification of Risk Framework itself has not found wide currency among those looking to optimise the impact of a hazard notification, although the dilemmas that it addresses are very familiar to those concerned with improving health behaviour as it attempts to explain the discrepancy often seen between expert opinion about the magnitude and potential consequences of a hazard and public reactions to it. Within the

framework, where public perceptions and/or impacts are such that the risk is perceived to be much greater than expert assessments would suggest are warranted, this is termed intensification. Conversely, where perceptions/behaviour suggest that the risk is much less than expert judgement would suggest, this is called attenuation. Attaining some concordance between public risk representations and behaviour and expert risk assessments is generally the position that those communicating health risks would like to achieve.

The Social Amplification of Risk Framework has a broad scope and certainly allows for the possibility that hazard notifications may modify the way the hazard - and indeed other hazards - are subsequently represented. Importantly however, the way in which these things might happen is not clear. The framework does not focus on the processes that direct risk amplification: nor does it specify the processes determining the ways in which the mediators and moderators operate, or the nature of their interactions. We would suggest that it is only as these processes are understood that the possibility arises of predicting and effecting change in the life of a hazard.

This paper introduces the concepts of hazard sequences and hazard templates. It outlines ways in which they can direct amplification processes. It is argued that these concepts will assist risk communicators in systematically considering the effect of what has gone before and developing risk communication strategies in this light of this. This is explored in relation to the hazard notifications surrounding the oral contraceptive 'pill scare' in 1995.

Hazard sequences

The notification of a hazard is rarely an isolated event. In relation to any hazard there are often several hazard notifications. These occur in a specifiable temporal sequence and are each open to risk amplification processes.

A hazard sequence can be characterized as a series of hazard notifications, which are structurally similar. There are at least three ways in which the hazard notifications may be similar and linked to form a hazard sequence.

1. It may simply be that they relate to the same hazard.
2. The hazard notifications may relate to the same axis of exposure. These may be, for example, biological, medical or technical. Social axes of exposure are also important. For example, it may be that where one agency is managing several hazards, the characteristics of the agency become important. In such a case it is likely that trust assumes a prominent role in attitudes to and decisions about the risks that the agency are managing (Cvetkovich & Löftstedt, 1999). A lack of trust may be associated with organizations to whom a lack of competence or independence is attributed.
3. Hazard notifications may be linked together as they have (or potentially have) the same outcome. For example, for a company, two different hazards with different axes of exposure may be linked as they threaten the same outcome; for example, of flight from their product.

This paper examines the hazard sequence of the oral contraceptive pill surrounding the 1995 'pill scare'. Further substantive research is needed to extend the concept of hazard sequences to situations where the hazards are linked by axis of exposure or outcome.

We would argue that links between hazard notifications and the nature of the hazard sequence can only be understood in the light of the hazard templates held by the public.

Hazard templates

Hazard templates are frameworks for making sense of risk information. They include information about the hazard itself, about the organizations, groups and individuals that are affected by it and that are involved in managing it. Hazard templates might include a range of scenarios relating to possible courses of actions and events, arguments about possible causes and effects, beliefs about what the event signals, and so on.

Hazard templates will vary in the extent of their adoption. At any one point there may be considerable consensus across a wide variety of publics and stakeholders. At other points in the lifetime of the hazard, acceptance and use of a template might be highly differentiated in relation to group memberships, locations, demographic characteristics etc.

The function of a hazard template is to enable ease of communication. Hazard templates provide readily accessible beliefs and arguments within which to locate new information about a hazard contained in a hazard notification. The information which they contain is socially shared and thus speedy understanding of the key elements of information about the hazard is facilitated. They might be considered as a social heuristic; providing a useful rule of thumb guide to the hazard.

A hazard template can be considered as a social representation of the hazard, the content of which is a function of the hazard sequence. Breakwell's (2001) discussion of the way in which social representations underlie mental models of hazards (Fischhoff, Bostrom &

Jacobs Quadrel, 1997) can also inform a consideration of the processes that underlie the genesis and development of hazard templates across the hazard sequence. Social Representations Theory is argued to hold particular promise for exploring changing understandings of risk issues insofar as one of the most important functions of social representations is to make the unfamiliar familiar. This theory has been systematically used to understand the processes underlying the public understanding of science (Bauer & Gaskell, 2001; Wagner & Kronberger, 2001)

Breakwell notes that social representations as a product are widely shared frameworks for evaluating and explaining events. These are generated through the

“whole package of activity (communication, exchange, argumentation) in which individuals and groups engage to make meaningful changes in their physical and social environments” (Breakwell, 2001, p.342).

Anchoring is one of the processes that underlies this and is particularly relevant to a consideration of how hazard sequences direct the formation and development of hazard templates.

Anchoring transforms novel and uncertain information about hazards into familiar aspects of our social reality. Individuals and groups faced with such information seek to interpret it in terms of their existing belief systems and categories. Objects thus obtain their significance in relation to prevalent social representations. This significance may reside in their similarity or in their difference. An often cited example of this notes how AIDS was initially understood in terms of venereal diseases like syphilis or as a mark of divine punishment before a specific representation distinguishing it from other sexually transmitted diseases developed (Marková & Wilkie, 1987).

Despite both being usefully grounded in relation to social representations, there are important differences between hazard templates and mental models. Firstly, hazard templates reflect the socially shared experience of the hazard sequence. Secondly, the function of hazard templates is to enable ease of communication between people about the hazard. They enable sense to be made of hazard notifications in ways that enable immediate links with the understandings of others. Thirdly, hazard templates function as heuristics in the way that they enable speed, both in incorporation of new information and in communication of the (possibly) revised template with others.

Exploration of the hazard sequence means exploring the relationship between hazard notifications and hazard templates across the lifetime of the hazard. This involves looking at how the content and structure of the template changes as a function of the series of hazard notifications, i.e. the hazard sequence. Understanding these relationships has implications for those engaged in risk communication. For example, to predict the likely impact of a hazard notification we would argue that it is necessary to understand the content of the hazard template, to know how the template has developed over the hazard sequence, how it is constituted and thus where new notifications are likely to be anchored. Knowing the content and the structure of the hazard template will heighten anticipation of reactions to a hazard notification and will be indicative of the potential for risk amplification.

It is not difficult in relation to many hazards to retrospectively identify what might seem to be a critical point in time that defines the subsequent life cycle of the hazard (e.g. the March 1996 announcement about the possible link between BSE and CJD). However, for those concerned with managing public health risks it is more important to be able to

anticipate the likely impact of a hazard notification and how this might trigger such a critical point. We would suggest that understanding the hazard sequence is an essential part of being able to predict those points where there are likely to be significant changes in the orientation, tempo or strength of the hazard template.

Examination of the chain of events characterised as the ‘pill scare’ suggests that hazard sequences direct amplification processes (Breakwell & Barnett, 2001) and that they play a particular role in normalising hazards.

Hazard Sequences and the Oral Contraceptive Pill

An illustration of how hazard sequences may affect processes of risk amplification can be provided in relation to the series of hazard notifications relating to the oral contraceptive pill following arguably the most significant notification of the sequence in October 1995. This notification and its associated impacts are more commonly referred to as the ‘pill scare’. This case study outlines the context in which the October 1995 hazard notification was made. It outlines preceding events before plotting subsequent hazard notifications.

A range of material was gathered to develop this case study. Six in depth interviews were conducted with people that were involved in the ‘pill scare’ in a variety of capacities: from the media, the Medicines Control Agency, the British Pregnancy Advisory Service and the pharmaceutical industry. Information from the British Pregnancy Advisory Service library of press cuttings relating to events in 1995 was supplemented with internet searches of broadsheets between 1998-2000. All references

to the ‘pill scare’ from The Lancet and British Medical Journal coverage between 1995-2000 were documented. Electronic journals data bases were also systematically searched for other reporting and analysis of the ‘pill scare’ over this period.

Oral contraceptives have a history of being linked with negative health outcomes (Potts, 1991). During the 1970s and 1980s there had been pill scares which had been linked with impacts on both the birth rate and the number of abortions. Wellings (1985) observed that,

‘The response of women to publicity following adverse reports of oral contraceptives has been followed by a now familiar pattern in the last 15 years or so. Troughs in pill usage trends tend to coincide fairly consistently with emerging epidemiological evidence demonstrating possible morbid side effects’ (p.95)

The 1995 ‘pill scare’ is generally considered to have been triggered by a statement by the Committee on Safety of Medicines and the Department of Health in October 1995 (Department of Health, 1995a). However, in the preceding months there was much negative publicity for low dose contraceptive pills in relation to their potential association with thrombosis and pulmonary embolism. Firstly, individual case studies about women that had problems with the Pill were highlighted in the media. Secondly, in early 1995 there was considerable publicity in both the local and national press in relation to solicitors marshalling a multi party action against Schering Health Care Ltd. Thirdly, in July 1995, there was a World in Action programme dealing with thrombotic risk and the Pill. This suggests that over the course of 1995 these hazard notifications provided a context in which there was considerable sensitivity about the potential risks of the low

dose contraceptive Pill. However, the 1995 ‘pill scare’ is generally considered to have been triggered by the events of October 1995.

Late in the afternoon of Wednesday 18 October 1995, 190 000 letters were sent out to GP’s giving advice about the possible increased risks associated with third generation oral contraceptives (Committee on Safety of Medicines, 1995). The Medicines Control Agency, the mailing organisation and the Post Office were apparently each to some degree responsible for the fact that many GPs did not receive their letters until Friday 20 October or even after the weekend. By 0900 on Thursday 19 October the press were seeking further details. Following this, the information contained in the letter was given out at a press conference at the end of a routine briefing on an unrelated subject (Department of Health, 1995a). It was on the national news at 1300 that day and women started to contact their GPs, who in many cases knew nothing about it.

The hazard notification was ostensibly prompted by the results of three studies, at that time unpublished, submitted to the Medicines Control Agency. The results were considered to provide reassurance in respect of the two ‘second generation pills’ but suggested that third generation oral contraceptives containing desogestrel and gestodene were associated with around a twofold increase in the risk of thromboembolism, compared with those containing other progestogens.

No indication was given of the absolute level of risk associated with the third generation pills. The advice was that these pills should only be used by women who were intolerant of other combined oral contraceptives and were prepared to accept an increased risk of thromboembolism. All women were advised to complete their current cycle and

informed that no change in prescribing practice was required for any other combined oral contraceptive.

The following days saw further hazard notifications. Professor Spitzer, an author of one of the studies that the Committee on Safety of Medicines conclusions were based on, flew into London and convened a press conference. He disagreed with the conclusions drawn from the data arguing that the Committee had acted prematurely and misinterpreted his study (Furedi and Furedi, 1996). A further Department of Health press release was issued to respond to suggestions made by Professor Spitzer and justifying the course of action taken as being in the interests of public health, denying that it was premature or incorrect (Department of Health, 1995b). The drug companies that produce the named pill brands sent letters to GPs and pharmacists suggesting that the Committee on Safety of Medicines had acted prematurely on the basis of what they termed a ‘preliminary evaluation of the data’ (Schering Health Care Ltd., 1995) that was ‘inconsistent with more than ten years of clinical trial data’ (Wyeth Laboratories, 1995).

A variety of both short and longer term impacts of the October 1995 hazard notifications have been documented leading to the conclusion that “It seems that the 1995 pill panic has had a significant, if unintended *negative* impact on public health” (Furedi, 1999, italics are the authors).

An impressionistic picture of initial consumer reaction can be gleaned from the letters pages of medical journals relating the experiences of medical professionals. For examples see Hope (1995), Rouse (1995) and Armstrong and Reid (1995). Doctors were inundated with the ‘worried well’: many women did not finish taking their current course of pills. Mini-surveys carried out within particular practices documented the way in

which women had responded. Telephone help lines recorded massive increases in questions from both users and health professionals (Furedi & Furedi, 1996). Walling (1996) suggests that more than half of all pill users sought urgent medical advice and that average consultation times doubled. It is likely that there was also heightened GP concern about the possibility of litigation which would be associated with defensive prescribing practices (Furedi, 1999).

Looking longer term, there were direct impacts of the event on patterns of pill use.

Farmer, Williams, Simpson *et al* (2000) noted that,

"After the announcement, a large proportion of women taking these so called 'third generation' combined oral contraceptives either discontinued use or changed to other formulations"(p.477).

A survey commissioned by Schering Health Care Ltd found that in 1993 24% of the women questioned said they would never consider the pill as a method of contraception. By 1996 this had risen to 33% (Schering Health Care Ltd, 1996).

There were also indirect unproveable impacts of the 'pill scare' on pregnancy and abortion rates. There was an increase in conceptions generally and teenage pregnancies in particular.

"The total number of abortions notified in England and Wales in 1996 was 8% higher than in 1995 and reversed the progressive decrease in the annual numbers that began in 1991" (Furedi, 1999, p. 621).

In 1999 the Office of National Statistics drew attention to the maintenance of this trend (Office of National Statistics, 1999) and suggested that this may still be due in part to a crisis in confidence in oral contraceptives following the 1995 ‘pill scare’.

Three main reasons have been cited as to why the Department of Health hazard notification led to the pattern of risk intensification known as the 1995 ‘pill scare’.

Firstly, the debate and disagreement between experts about the accuracy and reliability of the scientific evidence. This continued as drug companies appealed against the recommendation of the Medicines Control Agency as to the information that should be included in oral contraceptive product information. The Medicines Commission ruling on this in April 1999 (Department of Health, 1999) was generally reported in the media as indicating a U-turn on the part of the Agency.

Secondly, the content of the Committee on Safety of Medicines communication in October 1995, both in terms of what was said as well as what should have been said. It was stated that the affected pills were associated with a twofold increase in the risk of thromboembolism compared with those containing other progestogens. It was not stated that compared to other oral contraceptives, the risk of a thrombosis would increase from 15 women out of 100 000 per year to 30 women. Neither the subsequent risk of dying from a thromboembolism (i.e. 2 in 100) nor the risks of thromboembolism occurring naturally in pregnancy were included (Furedi, 1999). This focus on relative risks was seen to play into the hands of the media (Dean, 1996).

Thirdly, the timing of the Committee on Safety of Medicines communication initially led to many patients being more aware of the advice than were their doctors. From the perspective of the Medicines Control Agency, the timing of the communication was

understandable. The option to be proactive in releasing the information was made against the background of continuing bad press and fear of leaked information about the studies. A senior figure at the Medicines Control Agency said,

“We were in damage limitation mode. The background was one of bad news. There had been the World in Action programme which had associated the Pill with possible problems - on the basis of poor evidence. At the time the (Agency) were aware of strong evidence to suggest that there were problems. Whatever we did it wasn't going to be good”.

Other Oral Contraceptive Hazard Notifications

Following events in 1995 there have been other hazard notifications in relation to the oral contraceptive pill.

In June 1996 the Committee on Safety of Medicines wrote a ‘Dear Doctor’ letter to GPs informing them of the imminent publication in the Lancet of a meta-analysis of studies of oral contraceptives, the finding of the small increased risk in breast cancer, and the likelihood of this information appearing in the press over the following weekend (Committee on Safety of Medicines, 1996). No change in prescribing practise was recommended. It was stated that patients should be reassured that there was no reason to stop taking the pill and that the balance of risks and benefits for oral contraceptives was favourable. Information that could be given to patients was attached.

This story was leaked, prior to the Lancet publication, under the headline, ‘Pill users face 10 year tumour risk’ (Rogers, 1996). Headlines the following day included, ‘Pill in new scare over breast cancer’ and ‘Birth pill carries breast cancer risk for 10 years’. The

Editorial (1996) in the Lancet condemned the tone of the coverage, dubbing it as sensationalist although in the event secondary reporting was limited and there was no evidence of increased public anxiety.

There was similarly little public reaction when, in December 1997, the media picked up the link between ischaemic stroke and oral contraceptives, published in the British Medical Journal (Heinemann, Lewis, Thorogood *et al.*, 1997). This reported that women were 2.9 times more likely to have a stroke if they were taking oral contraceptives but concluded that their benefits far outweighed the risks. There was evidence of some sensationalised reporting by the media (e.g. von Radowitz, 1997) with attempts to provide more balanced information (e.g. small absolute risk, benefits of oral contraceptives) generally reserved for the small print.

1999 saw expert disagreement in this area following the publication of a 25 year study by the Royal College of General Practitioners (Beral, Hermon, Kay *et al.*, 1999). This reported that 10 years after giving up the pill women were at no greater risk of developing cancer than those who had never taken it. Dr Clifford Kay, who began the study in 1968, stated that the study would help alleviate fears about the side effects of the pill. The results were reported by the national press in terms of the pill being given a 'clean bill of health' (Boseley, 1999a)

The headline in the same paper three months later was, 'Scientists in new row about the safety of the pill' (Boseley, 1999b). Many papers reported the views of Klim McPherson writing in the *Journal of Epidemiology and Community Health* (McPherson, 1999a) saying that the conclusions of the 25 year study were flawed because they used few of the women at the greatest risk from breast cancer and that breast cancer can remain latent for

20 years. It was suggested that the recent reassurances may have been seriously misplaced.

These assertions were rejected by other experts (Woodman, 1999). In July 1999, the *British Medical Journal* contained a rejoinder from McPherson (1999b) saying that his editorial was designed to reduce undue complacency about the safety of the pill and that ‘less illegitimate certainty is needed’.

Although there was thus evidence of expert disagreement and fear of another pill panic amongst family planning specialists (Boseley, 1999b), there was no prolonged coverage of the issue by the media nor any evidence of public anxiety.

Implications of the pill scare as a hazard sequence

The ‘pill scare’ of October 1995 was both preceded and followed by related hazard notifications and can thus be considered as a hazard sequence. The account given of the hazard sequence suggests that the October 1995 notification represents a critical hazard notification in the sequence; a turning point in the representation of oral contraceptive health hazards. Arguably, the hazard template shifted from a framework that held the pill as medically safe (although a possible hazard) to one where the pill is medically risky.

The case study presented above makes it clear that reactions to oral contraceptive hazard notifications after October 1995 were considerably more muted on the part of the public and the media. Following the critical hazard notification, there was evidence of intensification of the risk (both in relation to public perceptions and socio-economic impacts). Since that time public and media reactions to the hazard notifications have

increasingly approximated the level of risk generally suggested by expert assessments.

None of the notifications precipitated the magnitude of impacts linked with October 1995; they generally met with disinterest on the part of the public and the media.

What lies behind this picture of changed risk amplification processes? Clearly there are important substantive differences between the different hazard notifications in the sequence. Notably, the October 1995 message contained novel information: it was the first time that different levels of risk had been associated with different brands of oral contraceptive. Later notifications did not involve changes in prescribing practice. The link between oral contraceptives and thrombosis was also relatively novel in that the most recent negative associations for the pill were with breast cancer and cancer of the cervix in 1993 (Wellings, 1985) and breast cancer in 1987 (Bromham, 1996). There were also differences in the predicted fatalities, in the human interest value of the stories and in the relationship each notification has with other news stories. Hammond (1996) suggests that the reason for the different reactions to the 1995 and 1996 hazard notifications lies in the differing reactions of the regulatory authorities. However, we would argue that considering these notifications as a hazard sequence allows consideration of processes that are a function of the relationship of these notifications to each other. Specifically, we would argue that substantial revision to the existing hazard template of oral contraceptive risks was necessitated after the critical hazard notification, when the pill gained the status of dangerous but necessary. Subsequent hazard notifications merely confirmed its status. They did not require further adjustment of belief or action. Several processes can be identified that might play a part in this.

Firstly, the reactions of pill users to later notifications in the hazard sequence is constrained by their reaction to earlier ones. Those that react at the time of the first scare in terms of stopping oral contraceptive use are not available to react to subsequent scares. Of those that continue to use the pill, some of them will have decided on the cost-benefits at the point of the critical hazard notification. Later hazard notifications will be responded to on the basis of the hazard template formed at this point. There was no new information at later notifications that necessitated substantial revision to this template. In this way all public reaction that would be visible has been seen. This argument is supported by the evidence suggesting that prior to the October 1995 notification, many women did not know that the pill may increase the risk of venous thrombosis (Allison, Roizen, & Olivier, 1997). For these women, the hazard template of the pill being a potential risk in this way would not have been formed until October 1995. There is some evidence that teenage girls were most affected by the 1995 scare in that they experienced the most notable rise in the number of unwanted pregnancies (Furedi, 1999). It would have been very unlikely that this group were sexually active at the time of the previous hazard notification in relation to oral contraceptives and it is therefore likely that they in particular had little awareness of the potential risks associated with the Pill. Arguably then, they were the group that had the maximum potential for a visible reaction.

The way in which reaction to one hazard notification constrains the range of responses available in a later one was noted in relation to the Tylenol drug scare. Here the reaction to a second incident was much more muted than the first. An analysis of the economic impacts associated with the hazard sequence suggested that

“much of the adjustment in the probability of drug tampering had already taken place and consequently little stock market effect should be expected” (Mitchell, 1989, p.616).

There are other processes that help explain the attenuated responses to oral contraceptive hazard notifications after the critical hazard notification in the sequence. Pill users will be subject to peer group normalisation; that is, they will receive information from their peer group that increasingly normalises the association between the pill and health risks. They will also be the target of an increasing amount of post scare medical reassurance.

Secondly, any explanation of the effect of a hazard sequence on reactions to any particular hazard notification must take account of the role of the media. Within the Social Amplification of Risk Framework, indeed within the risk literature in general, the media are a key station of amplification and are often held responsible for increasing people's concerns. However, the processes that govern their influence remain largely unspecified. Recent work that has explored decision making in the media has noted the way in which hazard templates direct decision making processes in the media about how hazards should be reported (Breakwell and Barnett, 2001). Several implications of hazard templates in the media for the normalisation of risk can be suggested.

Decision makers within the media accumulated, filtered and verified new information against the October 1995 template; this became the framework against which new information was assessed. Later notifications in the oral contraceptive pill hazard sequence show no evidence of being linked with a change in the hazard template. They did not render the template obsolete; it was not stretched or challenged in any substantive way. Examples can be given of the way in which the hazard template constructed in

relation to the critical hazard notification for the oral contraceptive pill directed reporting practices for subsequent hazard notifications. Firstly, reporting of the later hazard notifications often referred back to the 1995 ‘pill scare’, that is, later reporting of oral contraceptive risks was anchored in relation to the critical hazard notification. Secondly, the hazard template derived from the October 1995 notification appeared dominant to the point of being (inappropriately) over generalised. For example, the Medical Editor (1996) of the Daily Telegraph under the headline ‘Pill sales slump after scare’ (Daily Telegraph, 1996) largely focused upon litigation issues in relation to contraceptives not implicated in the 1995 ‘scare’.

It is interesting that over the course of the hazard sequence there is some evidence of a clear awareness in the media of the undesirable impacts of the October 1995 hazard template. This stands in stark contrast to the role that the media are often perceived to have. They were often blamed by the medical establishment for sensationalising the risks of oral contraceptive use following 1995 and have been held responsible for pessimism about the side effects of OCs (Potts, 1991) and for the variation in pill discontinuation rates (Jones, Beniger, & Westoff, 1980). Interview material with media editors suggested that there was evidence of a desire for socially responsible reporting later in the hazard sequence (Breakwell and Barnett, 2001). This was also remarked on, if slightly obliquely during an interview with a senior figure at the Medicines Control Agency who said,

“The pill was damaged in 1995 and since then even the media have been loathe to cover the pill issues in a negative way. The media were aware that to some extent the ‘pill scare’ had been over-hyped and thus were unwilling to trigger further publicity in this area.”

It was also suggested by the interviewee that this reticence was indicated by the way in which the media ‘missed some snippets’ in the results of the Royal College of General Practitioner’s study that might have suggested that the results were not as reassuring as they appeared. This apparent increase in socially responsible reporting over the course of the hazard sequence is another factor that can be seen to contribute to the normalisation of oral contraceptive pill risks.

In conclusion then, this paper has introduced the concept of hazard sequences and hazard templates and suggested how they can increase understanding of social amplification of risk processes. It has been argued that the concept of hazard sequences can help explain responses to and impacts of the hazard notifications that followed the 1995 ‘pill scare’.

As noted above, it is not being suggested that there were no intrinsic differences between the different hazard notifications. Clearly there were. However, we would argue that changing patterns of amplification are also a function of the position of the notifications within the hazard sequence. Individuals, and other stations of amplification such as regulatory agencies, pressure groups and the media, are all constrained in their choice of hazard template by the hazard sequence. Most notably they are constrained by critical hazard notifications. In turn, knowing which hazard templates are current and how they are changing is vital in assessing how new information is likely to be received. Clearly there is much scope for further research in this area but the early indications are that consideration of hazard templates and hazard sequences has the potential to inform the design and execution of risk communication strategies. We would argue that all aspects of a hazard notification – not only the content but also its timing, the source of the

information and the intended medium of communication - should be planned in the light of an understanding of hazard templates and the hazard sequence.

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